

Revision 1: Retina – Optic – Neuro - Orbit

1. Define the following.....

Diabetic retinopathy (DR)	• Bilateral retinal affection (Microangiopathy affecting retinal small Vs arterioles, capillaries & venules) D ₂ DM.
Retinal detachment (DR)	• A condition in which the retina is separated into 2 layers (sensory retina "inner 9 layers" & RPE) by (SRF) → sub. retinal fluid
Retinitis pigmentosa (RP)	• A group of hereditary (Familial) disorders CCC Bilateral, Symmetrical, progressive degeneration of RPE & photoreceptors of unknown cause.
Optic atrophy (OA)	• The condition of the Disc when degeneration of optic nerve fibers "axons of G cells" at any point from G cells to LGB. Due to ... "Causes"
Papilledema	• Passive "non-inflammatory" edema of the optic disc mostly D ₂ ICT. in 70% of cases.
Orbital cellulitis	• Acute suppurative inflammation of orbital cellular tissue.
Dysthyroid ophthalmopathy	• Ocular and orbital changes that occurs with thyroid dysfunction.
Proptosis	• It is a passive / mechanical protrusion of eyeball outside the orbital rim by a retro bulbar mass. → ms of eye not affected
Exophthalmos	• It is an active protrusion of eyeball outside the orbital rim d ₂ endocrinal cause (Grave's disease). → ms of eye is affected.
Scotoma	• Visual field defects surrounded by Normal field "islands of blindness".
Amblyopia كسل العين	• Impaired vision in absence of an organic cause mainly D ₂ lack of use of 1 or 2 Foveae for vision → decreased V/A. due to prolonged disused of Fovea.
Hemianopia	• Complete loss of one half of the visual field.

opia → visual field
anopia → no visual field.

2. Mention the functions of.....

RPE → POVAA	• <u>O</u>uter blood retinal barrier: nutrients in & waste products out. • <u>P</u>hagocytosis of outer set of rods & cons if there is any tissue damage. • <u>V</u>it.A metabolism: essential for rhodopsin & iodopsin synthesis. • <u>A</u>bsorption of scattered light: by xansophile, melanin. • <u>A</u>dhesion with sensory retina: prevents RD.
PRP pan retinal Photo Coagulation → RDS	• <u>R</u>egression of the neo Vs. • Improves <u>c</u>entral circulation. • <u>D</u>estroy hypoxic into anoxic area: no Vasogenic material.
Enucleation → 45	• <u>S</u>top pain: in absolute glaucoma. • <u>S</u>ave life: in IO malignancy. • <u>S</u>ave another eye: hopeless traumatized eye (sympathetic ophthalmitis). • <u>C</u>osmetic reasons: in total anterior staphyloma.
OCT → دائرة	• OCT of the macular thickness: diagnose M. edema – Choroidal new Vs. • OCT of the RNFL thickness: diagnose Chronic Glaucoma & optic atrophy
Cilio-retinal artery	• It is a separate artery from one of posterior ciliary arteries supplying the Macula: maintain central (tubular 6/6) vision if CRAO.
Anti VEGF (Avastin)	• It inhibits Vasogenic material secreted from ischemic retina as (ischemic CRVO & DR): prevents Neovascularization (glaucoma, Hyphema).

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3. Anatomy / Enumerate Layers of.....

الطب من العين → function

Retina	Retina is composed of 10 layers from outwards inwards... 1- <u>RPE</u>. + function 2- <u>Photoreceptor</u> layer. 3- <u>Outer</u> limiting membrane. 4- <u>Outer</u> nuclear layer. 5- <u>Outer</u> plexiform layer. 6- <u>Inner</u> nuclear layer. 7- <u>Inner</u> plexiform layer. 8- <u>Ganglion</u> cell layer. 9- <u>NFL</u>. 10- <u>Inner</u> Limiting membrane.
Visual pathway	1- Photoreceptors: rods and cons, which synapse with Bipolar & G cells. 2- Axons of G cells → NFL, which converge to form O. nerve. 3- At the Optic chiasma: - Nasal fibers: decussate to reach Optic tract of opposite side. - Temporal fibers: pass un crossed to the ipsilateral Optic tract. 4- Each optic tract has ipsilateral temporal & contralateral nasal fibers. 5- Optic tract → LGB → new axons spread out to form Optic radiation. 6- Fibers of O. radiation → visual cortex - Area 17: 1ry visual area. → إلى بوشوف - Area 18, 19: visual associative area. → إلى بوشوف الصورة

4. Mention 5 clinical signs of.....

والأشياء

CRVO	• <u>Pupil</u>: Sluggish reaction. • <u>Fundus</u>: • Veins: Engorged, tortious. • Retina: Hge, exudate "soft in ischemic". • Disc: hyperemic, edema. • FA: Delayed A-V filling.
CRAO	• <u>Pupil</u>: APD. • <u>Fundus</u>: - Arteries: attenuated. - Retina: Milky white. • Vision: no PL • Veins: Blood column is segmented. • Macula: Cherry red spot.
Retinal detachment (DR) DR	• <u>RR</u>: grey. • <u>Tonometry</u>: soft d₂ absorption of SRF. • <u>Fundus</u>: - Retina: wavy. - Retinal tear is seen. • Slit lamp: Tobacco dust & Aq. Flare. • Arteries: wavy. • R.Hge may be seen.
Background DR (Simple)	• <u>Ret.Hge</u>: Dot (deep, rounded). • <u>Bl. Vs</u>: micro aneurysms. • <u>Ret.exudate</u>: Hard. • <u>Macula</u>: CME.
Pre proliferative DR	• <u>Ret.Hge</u>: Dots & blots. • <u>Bl. Vs</u>: IRMA & venous beading. • <u>Ret.exudate</u>: Hard & soft. • <u>Macula</u>: CME.
Proliferative DR	• <u>Ret.Hge</u>: Blots. • <u>Bl. Vs</u>: NVDs & NVEs. • <u>Vitreous Hge & RD</u>. • <u>Ret.exudate</u>: soft. • <u>Macula</u>: CME.
Advanced DR	• Recurrent persistent Vit.hge. • Rubeosis iridis. • Iridocyclitis & complicated cat. • Tractional RD.
CSBMA	• Hge / edema / exudate "hard/soft" within 500 μm from fovea + any of <u>micron</u>.

* clinical significant
macular oedema →

500 μ m from
fovea

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* macular oedema → 1500 μ m from fovea

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Retinitis pigmentosa (RP)	• Fundus: - Retina: spider like pigment at equator. - Arteries: attenuated. - Disc: consecutive Optic atrophy. • Perimetry: early (Ring scotoma) – Late (Tubular field). • ERG: affected especially scotopic vision. • macula: macular fan.
Papilledema	• Disc: hyperemic / elevate = 9D / ill defined. • Pupil: APD. • Veins: engorged & tortuous. • VF: scotoma for red & green. Blue
1 ^{ry} Optic atrophy (OA)	• Disc: - Color: milky white. - Vs: Normal. - Edge: well defined. - Lamina: well seen. - Cup: Enlarged. - Retina: normal.
2 ^{ry} Optic atrophy	• Disc: - Color: pale grey. - Vs: Sheathed. - Edge: ill defined. - Lamina: Obscured. - Cup: Obliterated. - Retina: normal.
Glaucomatous O. atrophy	• Disc: - Color: pale yellow. - Vs: Nasal shift &.... - Edge: well defined. - Lamina: well seen. - Cup: Enlarged. - Retina: normal.
Consecutive o. atrophy	• Disc: - Color: Yellow "waxy". - Vs: attenuated. - Edge: ill defined. - Lamina: Obscured - Cup: Obliterated. - Retina: shows cause.
Orbital cellulitis	• Lid: edema & hyperemia. • Conj: chemosis & conges. • Abscess: may form & points through lower fornix or skin near lower orbital margin. • Proptosis. • O. motility: limited.
Dysthyroid ophthalmopathy	• Proptosis: Is the commonest cause for both uni & bilateral proptosis. • Eye lid signs: - Dalrymple sign "UL retraction". - Stelwag: infrequent blinking. - lid lag "von greave sign". - Mobius sign: lack of convergence • EOM: weakness & restricted motility (IR-MR-SR-LR). • Progressive optic neuropathy.
Cavernous sinus thrombosis	• As orbital cellulitis + Fundus (engorged veins & papilledema ± Papillitis) + edema of mastoid (the most important early DX sign) + Marked general signs (fever & rigors).
Retinoblastoma	• (Leucoria) = white pupillary reflex (the commonest presentation) Fundus: - elevated white mass in the retina. - seeding of malignant cells in the vitreous. - Foci of chalk like calcification. • Squint: if it affects macular area (the 2nd most common presentation). • 2^{ry} glaucoma: D₂ toxic metabolites. • Proptosis: D₂ EO extension. • Pseudo hypopyon with esotropia.

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Mention 5 complications of..

Scleral buckling حزام ال sclera RD علاج	1. Pre-operative: complications of Retro bulbar anesthesia (retrobulbar hematoma -globe perforation - Optic nerve damage) ^{Stump واحد} 2. INTRA-OPERATIVE: dry eye - traumatic injury to: iris /cornea / EOM. ^{Toxicity from over dose} 3. POST-OPERATIVE: increased axial length → myopia / scleral necrosis / Glucoma / metamorphopsia / tight buckle → signs of ischemia (CRVO / CRAO).
Retro bulbar anesthesia	As above + Local anesthetic toxicity.
Vitrectomy زوال البصمات	Pre-operative: complications of Retro bulbar anesthesia (retrobulbar hematoma -globe perforation - Optic nerve damage). POST-OPERATIVE: * Intraoperative: - RD - Complications of silicon oil (Dry glaucoma / c. cataract / inverted Hypopyon). if the pressure ↑ → CRAO or CRVO لا الزيت يرفع قوتها
Laser photocoagulation لصمات	Pre-operative: anesthesia - Topical anesthesia results in anesthetic cornea - Sub-Tenon's anesthesia also may cause paralysis of the ocular muscles INTRA-OPERATIVE: Scatter of the laser beam, particularly by vitreous hemorrhage. POST-OPERATIVE: - field defect → night blindness. - Rupture of large Bl. Vs → Vit.hge. - Iris, uveal burn. - Excessive power → retinal, sub retinal or choroidal hemorrhage. - Choroidal neovascularization. ^{لو من غلظت مع كثر ال choroid وبعيل}
Enucleation	Pre-operative: complications of Retro bulbar anesthesia (retrobulbar hematoma -globe perforation - Optic nerve damage). INTRA-OPERATIVE: Removal of the wrong eye, Damage to or loss of EOM or Hge. POST-OPERATIVE: - Exposed Orbital Implant: risk for extrusion. - Post-enucleation socket S: deep sulcus + poor fitting. ^{اخترت المصراع اعطى العين}
Orbital cellulitis	1. Abscess: It points in the skin of the lid near the orbital margin or into the fornix. 2. Pan ophthalmitis: is a serious condition. 3. Purulent meningitis & cerebral abscess: may occur occasionally. 4. Optic atrophy: results in permanent loss of vision. 5. Cavernous sinus thrombosis.
DM on Eye	Retina: A. Ch: Lens: EOM: Lid: Cornea: Conjunctiva: Refraction:
RD	

3. Enumerate types of ...

DR	1- Simple (Background)(NPDR). 2- Pre proliferative DR. 3- Proliferative Dr (PDR). 4- D. maculopathy. 5. Advanced diabetic eye.
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RD	1- 1ry (simple / Rhegmatogenous). 2- 2ry (Exudative) & (Tractional).
RP	1- Typical / classical → Bilateral, has symptoms and pigments at retina. 2- Atypical: - Unilateral RP. - Inverse pigmentary degeneration - RP sine pigmento: has same symptoms but no pigments. - RP Punctata albescentia: with white pigments. - Sectorial RP.
Orbital cellulitis	• Preseptal (periorbital cellulitis): is infection of the eyelid & surrounding skin anterior to the orbital septum (no fever / pain). • Orbital cellulitis: is acute suppurative inflammation of the soft tissues of the eye behind the orbital septum (fever / pain).
Optic atrophy	• 1ry optic atrophy. • Glaucomatous optic atrophy. • 2ry optic atrophy. • Consecutive optic atrophy.
Thyroid eye dse (exophthalmos)	• Thyrotoxic (dysth...): increased T3, T4 → sympathetic + of ocular Ms. (mild) • Thyrotrophic (Malignant): increased TSH. (extreme exophthalmos)
Hemianopia	• Heteronymous: involving opposite sides of visual field (Bitemporal / Binasal) • Homonymous: involving the same sides of visual field (Rt / Lt).
Scotoma	• +ve "patient is aware about the defect" & -ve "العكس e.g. blind spot" • Absolute "No PL in affected area" & Relative "defect in certain color". • According to site & shape: - Central scotoma. - Disseminated scotoma. - centro-cecal scotoma. - Enlargement of blind spot.
Amblyopia	• Strabismic amblyopia: to avoid diplopia. • Toxic amblyopia: D₂ chronic retro-bulbar neuritis. • Anisometropia amblyopia: to avoid diplopia. • Visual deprivation amblyopia: D₂ Unilateral opacity in refractive media. • Nystagmus amblyopia.

7. Mention 5...

4. مزيج تشريح مطبق مع كل مرضين

DD of cherry red spot	1- CRAO. 3- Quinine poisoning. 5. Macular hole surrounded by RD.	2- Trauma (Comotio R). 4- Tay sack disease.
DD of night blindness (Nyctalopia)	1. Vitamin A deficiency. 3. Peripheral lens opacity. 5. Retinitis pigmentosa. 7. Extensive chorioretinitis.	2. Liver diseases, e.g. cirrhosis 4. OAG. 6. Congenital night blindness 8. Oguchi's disease
DD of Leucoria	1. Congenital cataract: It is the most common cause in early childhood. 2. Retinoblastoma: It is the most serious cause & the most common malignant tumor occurring in childhood. 3. Pseudo glioma: Several conditions in children give rise to similar signs and cause great difficulty in Dx.	

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- **Inflammatory deposits** in the vitreous following a plastic cyclitis or choroiditis.
- **Tuberculosis of the choroid** specially the confluent type.
- **Toxocara infestation.**
- **Congenital defects**, due to persistent hyperplastic vitreous at the back of the lens.
- **Retrolental fibroplasia:** It is common in premature babies due to hyperoxygenation.

4. **Other causes**

- Coats disease.
- Choroidal coloboma.
- Retinal dysplasia.

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Causes of RD	
Causes of Proptosis	
Causes of Consecutive O.A	
Causes of papilledema	
Causes of CRAO / CRVO	

8. Give an account on....

RD	DEF .. R/F .. C/P ... Complications ... Principles of ttt. Principles - To find all retinal breaks by careful pre + intra operative examination. - To create firm chorio-retinal adhesion surrounding each break by cryotherapy or Laser. - To support retinal break by sc.buckle or intra Vitreal inj. of air bubble
DR	DEF ... Types ... Complications ... TTT
CRVO	Types... causes ... Signs ... complications ... TTT.
Optic atrophy	DEF ... Types ... Signs ... TTT.
Dysthyroid ophthalmopathy	DEF ... Types ... complications ... Signs ... TTT.
CRAO	Types ... causes ... Signs ... DD.
RP	DEF ... causes ... Signs ... TTT.
Orbital cellulitis	DEF ... causes ... Signs ... complications ... TTT.
Retinoblastoma	Incidence .. Presentation .. signs .. TTT.

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